

in this section for many years; at 4 a. m. the thermometer indicated  $-22^{\circ}$ .

Watertown, Jefferson county: the weather on the 20th and 21st, throughout northern New York, was the coldest known for many years. At this place the temperature fell to  $-28^{\circ}$  on the 20th, and to  $-38^{\circ}$  on the 21st; at other points in the county it fell to  $-40^{\circ}$ .

Oswego: the minimum temperature,  $-17^{\circ}.5$  on the 20th, is the lowest recorded since the opening of the signal office here, in 1871.

Rochester: the minimum temperature,  $-10^{\circ}.5$ , on the morning of the 20th is the lowest recorded in December since Signal Service observations were begun in 1871; lower temperature than the above has occurred in two instances only, viz:  $-12^{\circ}$  in January, 1873, and the same in February, 1875.

North Carolina.—Charlotte: weather very cold on the 19th; minimum temperature,  $11^{\circ}$ ; plants in the hot-houses were killed.

Fort Macon: on the 19th, the temperature fell to  $15^{\circ}.2$ ; on the 20th, ice was two inches thick.

Scott's Hill, 19th: weather very cold, minimum temperature,  $11^{\circ}$ .

South Carolina.—Charleston: the fountains and pumps in the city froze on the 19th.

Virginia.—Cape Henry: the minimum temperature on the 20th,  $15^{\circ}.3$ , is the lowest with two exceptions, viz:  $12^{\circ}$  in 1876 and  $7^{\circ}$  in 1880, that has been recorded since this station was opened in 1873.

Washington Territory.—Dayton: on the 31st the temperature fell to  $-26^{\circ}$ , being the lowest temperature yet recorded here; observations were begun in 1880.

Wisconsin.—La Crosse: minimum temperature on the 25th was  $-26^{\circ}$ , at 8 a. m.; this has been equalled in December in but an instance, viz: in 1876, since the station was established, in 1873.

Wyoming.—Cheyenne: on the afternoon of the 15th the temperature fell from  $32^{\circ}$  to  $-8^{\circ}$  in four hours, and on the 23d it fell from  $42^{\circ}$  at 2 p. m. to  $-12^{\circ}$  at 6 p. m.; a range of  $54^{\circ}$ . On the 16th the daily mean temperature was  $-7^{\circ}.0$ , the lowest being  $-13^{\circ}.4$ .

#### FROSTS.

Frosts occurred in the various districts on the following dates:

New England.—1st to 28th.

Middle Atlantic states.—1st to 11th, 13th, 14th, 16th to 28th, 30th.

South Atlantic states.—1st to 4th, 8th, 9th, 10th, 13th, 16th to 28th.

Florida peninsula.—Sanford, 3d; Cedar Keys, 19th, 30th; Archer, 2d, 3d, 10th, 19th, 20th; Tallahassee, 19th; Limona, 3d; Newport, 2d, 3d, 19th, 20th, Manatee, 3d, 4th.

East Gulf states.—1st, 2d, 3d, 8th, 9th, 16th, 18th, 19th, 20th, 21st, 25th, 26th.

West Gulf states.—1st to 4th, 6th, 7th, 8th, 12th, 13th, 15th, 16th, 18th, 19th, 26th, 31st.

Tennessee.—1st to 5th, 7th to 10th, 12th, 13th, 14th, 16th to 20th, 22d to 28th, 31st.

Ohio valley.—1st to 5th, 8th, 9th, 10th, 13th, 14th, 18th, 19th, 20th, 25th, 26th, 27th.

Lower lake region.—1st to 10th, 19th, 20th, 23d, 25th, 26th, 27th.

Upper lake region.—1st to 4th, 9th to 27th, 30th, 31st.

Extreme northwest.—1st to 31st.

Upper Mississippi valley.—1st to 5th, 8th to 27th, 31st.

Missouri valley.—1st to 31st.

Northern slope.—1st to 18th, 20th to 31st.

Middle slope.—1st to 4th, 8th to 18th, 20th to 31st.

Southern slope.—1st, 2d, 3d, 7th, 9th, 11th, 12th, 15th, 16th, 17th, 19th, 20th, 21st, 25th, 26th, 27th.

Southern plateau.—1st to 31st.

Middle plateau.—1st to 6th, 8th, 10th, 11th, 28th to 31st.

Northern plateau.—1st to 18th, 27th to 31st.

North Pacific coast region.—1st to 13th, 15th.

Middle Pacific coast region.—1st to 6th, 9th to 16th, 27th, 29th, 30th, 31st.

South Pacific coast region.—Los Angeles, California, 2d, 3d, 6th, 13th to 17th; Poway, California, 1st, 2d, 3d, 14th to 17th, 30th.

#### ICE.

Ice formed at stations in the South, during December, as follows:

Jacksonville and Pensacola, Florida, 19th.

Wilmington, North Carolina, 19th.

Augusta, Georgia, 19th, 20th.

New Orleans, Louisiana, 19th.

Galveston, Texas, 18th.

Indianola, Texas, 18th, 26th.

Brownsville, Texas, 25th, 26th.

Fort Stockton, Texas, 12th, 18th, 19th, 25th, 26th.

#### PRECIPITATION.

[Expressed in inches and hundredths.]

The distribution of rainfall over the United States and Canada, for the month of December, 1884, as determined by the reports from more than seven hundred stations, is exhibited on chart iii.

In the following table are shown, for each of the geographical districts, as deduced from Signal Service observations, the average December precipitation for a series of years; the average for December, 1884, and the departures from the normal.

Average precipitation for December, 1884.

Districts.	Average for Dec. Signal-Service observations.		Comparison of Dec., 1884, with the average for several years.
	For several years.	For 1884.	
	Inches.	Inches	Inches.
New England.....	3.32	6.11	+2.79
Middle Atlantic states.....	3.42	5.55	+2.13
South Atlantic states.....	4.30	4.69	+0.33
Florida peninsula.....	2.49	3.79	+1.30
Eastern Gulf states.....	5.36	7.10	+1.74
Western Gulf states.....	3.93	9.91	+5.98
Rio Grande valley.....	1.94	0.83	-1.11
Tennessee.....	4.42	6.46	+2.04
Ohio valley.....	3.67	5.16	+1.49
Lower lake region.....	2.86	2.96	+0.10
Upper lake region.....	2.50	4.89	+2.39
Extreme northwest.....	0.92	0.99	+0.07
Upper Mississippi valley.....	1.96	4.24	+2.28
Missouri valley.....	0.78	0.82	+0.04
Northern slope.....	0.94	1.09	+0.15
Middle slope.....	0.64	1.17	+0.53
Southern slope.....	0.73	1.77	+1.04
Southern plateau.....	1.05	3.91	+2.86
Middle plateau.....	1.14	2.70	+1.56
Northern plateau.....	3.30	4.21	+0.91
North Pacific coast region.....	8.16	7.51	-0.65
Middle Pacific coast region.....	4.26	8.61	+4.35
South Pacific coast region.....	2.08	3.88	+1.80
Mount Washington, N. H.....	5.46	4.70	-0.76
Pike's Peak, Colo.....	1.24	1.50	+0.26

With the exception of the north Pacific coast region, Rio Grande valley, and at a few scattering stations in other districts, the precipitation for December has been excessive throughout the United States.

In the upper Mississippi valley, west Gulf states, southern plateau, and in the middle Pacific coast region, it has been exceptionally heavy, being more than double the average in these districts.

Decided excesses over the average also occurred in the upper lake region, New England, middle Atlantic states, Tennessee, Ohio valley, east Gulf states and Florida, the departures varying from 1.30 in Florida to 2.79 in New England. At Little Rock, Arkansas, the monthly precipitation was 16.92, or an excess of 13.40 over the December average for the four preceding years; at Shreveport, Louisiana, it was 15.55, or an excess of 10.91 as compared with the average for the last

eleven years; at Sacramento it was 10.45, the average for December during the last seven years being 3.05; at Olympia, Washington Territory, it was 5.52, or a deficiency of 4.34 as compared with the average for the seven preceding years. In the table of miscellaneous meteorological data are given the monthly precipitation for the several stations, with the departures from the average.

#### DEVIATIONS FROM AVERAGE PRECIPITATION.

The departures exhibited by the reports from the regular Signal Service stations are shown in the table of averages for the several districts, and in the table of miscellaneous meteorological data. The following notes in connection with this subject are reported by voluntary observers:

**Arkansas.**—Lead Hill, Boone county: monthly precipitation, 11.37, is 7.95 in excess of the average for the three preceding years.

**Mount Ida, Montgomery county:** monthly precipitation, 15.95, is more than double the amount for any December in the last thirteen years, with one exception, viz: in 1874, when it was 10.10.

**California.**—San Francisco: monthly precipitation, 7.68, is 2.47 in excess of the December average for a period of thirty-four years.

**Poway, San Diego county:** monthly precipitation, 5.91, is 3.70 above the December average for the last six years.

**Illinois.**—Mattoon, Coles county: monthly precipitation, 5.45, is 2.85 above the December average for the last four years.

**Swanwick, Perry county:** monthly precipitation, 5.78, is 3.59 above the December average for the last three years.

**Riley, McHenry county:** monthly precipitation, 3.28, is 1.35 above the December average for the last twenty-four years.

**Sycamore, DeKalb county:** monthly precipitation, 4.18, is 1.56 above the December average for the last three years.

**Indiana.**—Wabash, Wabash county: monthly precipitation, 5.44, is 2.65 above the December average for the last nine years.

**Vevay, Switzerland county:** monthly precipitation, 3.83, is 0.32 below the December average for the last twenty-one years.

**Spiceland, Henry county:** monthly precipitation, 6.47, is 3.30 above the December average for the last twenty-four years.

**Kansas.**—Independence, Montgomery county: monthly precipitation, 3.34, is 0.83 above the December average for the last twelve years.

**Emporia, Lyon county:** monthly precipitation, 1.81, is 0.69 above the December average for the last five years.

**Lawrence, Douglas county:** monthly precipitation 2.55 is 0.96 above the December average for the last sixteen years.

**Maine.**—Gardiner, Kennebec county: monthly precipitation 5.04, is 1.26 above the December average for the last forty-nine years.

**Maryland.**—Fallston, Harford county: monthly precipitation, 6.06, is 2.66 above the December average for the last fourteen years.

**Nevada.**—Carson City, Ormsby county: monthly precipitation, 4.75, is 2.56 in excess of the December average for the last five years.

**New Hampshire.**—Antrim, Hillsborough county: monthly precipitation, 5.10, is 1.39 above the average for the last twelve years.

**Contoocook, Merrimac county:** monthly precipitation, 4.50, is 2.00 in excess of the December average.

**New Jersey.**—South Orange, Essex county: monthly precipitation, 5.40, is 1.52 above the December average for the last fifteen years.

**New York.**—North Volney, Oswego county: monthly precipitation, 3.50, is 0.12 above the December average for the last thirteen years.

**Palermo, Oswego county:** monthly precipitation, 3.42, is 0.70 below the December average for the last thirty-one years.

**Ohio.**—Wauseon, Fulton county: monthly precipitation,

3.38, is 1.16 above the December average for the last twelve years.

The following table, showing the monthly and annual precipitation, from 1859 to 1884, both inclusive, at Portsmouth, Scioto county, has been prepared by Dr. D. B. Cotton, of that place. From this table it will be seen that the precipitation for December, 1884, exceeds the average by 1.00:

	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total for year.
1859	2.33	7.20	3.09	8.34	1.43	4.21	1.22	6.70	1.29	2.32	2.09	6.15	46.37
1860	3.94	1.05	1.01	4.24	3.59	1.90	3.96	2.57	3.18	1.58	4.64	2.25	33.91
1861	3.10	2.60	1.81	5.35	5.99	2.15	1.40	5.45	3.19	3.40	5.86	1.64	41.94
1862	7.25	4.08	4.98	6.15	1.56	3.34	1.81	2.50	1.16	1.50	2.26	2.60	39.19
1863	6.22	3.48	4.43	2.01	1.34	1.76	4.32	4.15	1.52	3.16	2.14	2.24	36.77
1864	1.92	1.45	2.68	2.26	3.29	2.94	1.00	4.11	2.35	3.05	5.52	4.34	34.91
1865	2.65	3.75	5.90	3.95	10.59	4.30	6.17	2.00	6.03	1.15	1.15	6.53	53.57
1866	4.61	3.07	3.09	2.87	1.33	2.93	4.72	2.82	9.79	3.41	4.82	1.51	45.07
1867	2.95	5.90	7.11	1.37	4.04	1.48	4.33	4.32	7.2	5.57	2.09	4.47	45.01
1868	1.81	.95	3.83	4.71	6.26	4.40	2.97	4.45	9.00	1.64	1.85	3.20	45.07
1869	2.82	2.52	4.57	4.22	3.86	4.70	4.20	2.21	3.48	2.28	3.82	3.16	41.84
1870	4.92	3.68	3.82	3.48	1.34	3.17	7.54	4.95	.75	2.99	2.18	2.04	40.86
1871	2.57	3.96	2.50	2.69	1.80	2.59	3.05	2.26	1.32	2.59	2.00	2.58	30.51
1872	.78	2.25	1.14	8.37	3.08	1.89	6.10	1.81	1.32	1.20	1.18	2.01	31.13
1873	1.60	4.85	3.01	1.97	4.75	3.48	7.12	4.98	2.58	4.95	1.94	4.94	46.19
1874	4.63	3.70	2.62	5.38	1.18	3.46	6.22	1.94	2.50	.24	3.64	2.80	38.31
1875	2.12	1.52	5.36	1.99	3.50	5.81	8.75	3.28	1.73	2.26	5.06	4.33	45.71
1876	4.25	2.47	4.45	2.53	1.00	3.69	6.75	3.54	5.60	1.82	3.67	1.45	41.22
1877	5.16	.36	5.16	2.59	1.97	3.60	5.11	1.39	2.20	1.79	2.44	3.24	35.01
1878	2.96	1.36	3.90	1.37	1.96	2.39	1.42	2.92	2.73	2.06	3.16	3.66	29.89
1879	3.19	2.73	3.29	.42	3.14	4.31	1.25	4.79	2.41	1.49	1.53	7.01	35.56
1880	4.05	5.80	4.56	5.94	2.03	4.65	2.85	5.54	3.99	2.90	3.05	3.61	48.97
1881	4.32	2.41	3.62	3.24	1.76	3.60	3.80	2.06	2.45	4.37	3.70	5.17	40.80
1882	8.82	6.28	4.19	3.09	8.49	6.85	3.44	6.69	3.66	1.72	1.30	1.68	56.21
1883	3.54	8.07	3.40	4.50	3.59	4.15	4.13	.82	1.46	6.47	3.08	5.36	48.57
1884	5.34	6.11	5.55	3.90	4.89	3.47	2.45	1.35	1.87	1.22	1.46	4.70	42.31
Mean	3.92	3.68	3.99	3.88	3.43	3.65	4.27	3.58	3.11	2.69	3.03	3.70	43.00

Monthly mean for 25 years, 3.58.

**Oregon.**—Mr. Thomas Pearce, voluntary observer at Eola, Polk county, reports that the total snowfall for December was 60.8 inches, and states that during a residence of thirty-four years at Eola, he has, at no time, seen as much snow as fell during December, 1884; at the close of the month the snow was eighteen inches deep.

**Dr. George Wigg, of East Portland, reports:** "the most snow since 1861; twenty miles from station the snow has drifted to depths of fifty feet."

**Pennsylvania.**—Dyberry, Wayne county: monthly precipitation, 3.74, is 1.17 above the December average for the last sixteen years. The monthly snowfall, fourteen inches, is about the average for December during the last twenty years.

**Vermont.**—Woodstock, Windsor county: monthly precipitation, 4.09, is 1.14 above the December average for the last sixteen years.

**Virginia.**—Wytheville, Wythe county: monthly precipitation, 3.02, is 0.10 above the December average for a period of twenty years.

**Variety Mills, Nelson county:** monthly precipitation, 4.74, is 0.98 above the December average for the last six years.

**West Virginia.**—Helvetia, Randolph county: monthly precipitation, 4.30, is 0.40 below the December average for the last eight years.

#### SNOW.

The dates on which snow fell in the various districts are as follows:

**New England.**—8th to 19th, 21st to 28th.

**Middle Atlantic states.**—2d, 9th, 11th to 21st, 23d to 27th.

**South Atlantic states.**—Atlanta, Georgia, 18th; Wash Woods, North Carolina, 18th to 21st, 26th; Kitty Hawk, North Carolina, 19th, 20th.

**East Gulf states.**—Vicksburg, Mississippi, 18th.

**West Gulf states.**—Fort Smith, Arkansas, 13th, 17th, 31st.

**Tennessee.**—Memphis, 17th, 18th; Knoxville, 18th, 25th, 26th; Nashville, 17th, 18th, 25th, 26th; Chattanooga, 18th.

**Ohio valley.**—1st, 9th, 11th to 25th, 31st.

**Lower lake region.**—1st, 8th to 26th, 31st.

**Upper lake region.**—1st, 5th to 31st.

**Extreme northwest.**—6th to 15th, 18th to 23d, 25th to 28th, 30th.

*Upper Mississippi valley.*—1st, 6th, 7th, 11th to 31st.

*Missouri valley.*—6th, 7th, 12th to 23d, 25th to 31st.

*Northern slope.*—4th to 31st.

*Middle slope.*—4th, 6th, 7th, 10th to 15th, 17th, 18th, 20th to 30th.

*Southern slope.*—Fort Stanton, New Mexico, 4th, 10th to 13th, 26th; Fort Davis, Texas, 11th; Fort Concho, Texas, 15th.

*Southern plateau.*—4th, 8th, 10th to 14th, 25th to 30th.

*Middle plateau.*—3d, 5th, 6th, 10th to 22d, 26th to 30th.

*Northern plateau.*—2d to 6th, 10th to 29th, 31st.

*North Pacific coast region.*—13th to 23d, 25th to 28th, 31st.

*Middle Pacific coast region.*—Red Bluff, California, 17th, 20th.

Snow-storms of unusual severity, interrupting travel, etc., have been reported as follows:

Concord, New Hampshire, 25th: the snow has drifted to such an extent on the northern and White mountain division of the Boston and Lowell railroad as to delay trains for several hours.

Oswego, New York, 18th: trains were snow bound on the Rome, Watertown and Ogdensburg railroad on the 17th. Snow was reported to have been three feet deep.

Grand Haven, Michigan, 22d: the snow-storm of this date was accompanied during the afternoon by a strong westerly wind which caused the snow to drift so as to seriously interrupt railroad traffic. Nearly all trains were delayed from two to three hours on the 23d.

Duluth, Minnesota, 31st: snow began at 7.30 a. m., accompanied by a high northwesterly wind, which caused the snow to drift to depths of from three to four feet.

Fort Assinaboine, Montana: a snow-storm, accompanied by high northwesterly winds, prevailed on the 19th. The mail was delayed for several hours in consequence of snow-drifts.

Pike's Peak, Colorado: a blinding snow-storm prevailed during the 21st and 22d; on the latter date the snow drifted half way to the roof of the observatory.

Denver, Colorado, 23d: snow blockades have occurred on both the San Juan branch and the Utah line of the Denver and Rio Grande railroad. Reports from Leadville on the above date stated that the snow at that place was three feet deep on the level, and was drifted badly. Many poorly constructed cabins were crushed beneath the weight of snow.

The following is from the "Chicago Times" of December 27th:

DENVER, COLO., December, 26th.—Continued storms and increasing drifts are reported from many points in the mountains. Leadville is nearly buried in the snow. The stores are reached by deep cuts through the drifts and the main floors have the character of cellars in their relation to the level outside. Railway communication with that city is kept open only by the constant use of snow plows and an army of shovelers, while the branches from that city are buried and the points to which they run are completely isolated. In the Monarch district of Chaffee county, near Marshall Pass, the average depth is given at ten feet, with many drifts of greater depth. Families are buried in their houses with limited food supplies.

Salt Lake City, Utah: one of the severest snow storms ever experienced here prevailed from the morning of the 21st until the morning of the 22d; nearly all trains due here were delayed and business was seriously interrupted.

Portland, Oregon, 25th: the recent snow-storms have caused a blockade between this place and Dalles. No eastern mail has arrived since the 15th.

San Francisco, California, 24th: a blockade has occurred at Redding, California, cutting off railroad communication between Portland, Oregon, and San Francisco. The superintendent of the railway mail service, owing to snow blockades on the Northern Pacific railroad, has ordered all mail for the east, accumulating at Portland, to be sent to San Francisco by steamer to be forwarded.

#### MONTHLY SNOW-FALLS.

[Expressed in inches and tenths.]

Monthly snow-falls of 3 inches or more were reported from the various states and territories during the month as follows:

*Arizona.*—Fort Grant, 15.0; Pantano, 5.0; San Simon, 3.0.

*California.*—Summit, 94.0; Cisco, 59.0; Emigrant Gap, 36.8; Truckee, 24.0; Delta, 15.0; Boca, 8.0; Keeler, 7.0; Bishop Creek, 4.5; Alta and Keen, 4.0; New Hall, 3.0.

*Colorado.*—Pike's Peak, 44.5; West Las Animas, 10.6; Pueblo, 7.8; Denver, 7.4; Fort Collins, 4.2.

*Connecticut.*—North Colebrook, 18.8; Southington, 14.5; Middletown, 13.5; New London, 13.2; Bethel, 12.6; Wallingford, 12.5; New Haven, 10.4; Norfolk, 10.0; Hartford, 9.6; Voluntown, 9.0.

*Dakota.*—Fort Totten, 13.7; Yankton, 13.4; Deadwood, 12.9; Vermilion, 11.0; Richardton, 8.4; Fort Bennett, 7.4; Webster, 6.7; Huron, 5.3; Fort Buford, 4.7.

*District of Columbia.*—Washington City, 4.4.

*Idaho.*—Boisé City, 37.0; Lewiston, 26.6.

*Illinois.*—Greenville, 18.5; Rockford, 12.2; Bunker Hill, 11.3; Marengo and Riley, 11.2; Prairieville, 10.5; Sycamore, 10.3; Mattoon, 9.7; Griggsville, 9.4; Aurora, 9.1; Chicago, 8.8; Springfield, 8.2; Wilton Centre, 8.0; Mascoutah, 6.9; Edgington, 6.0; Swanwick, 5.5; Peoria, 5.0; Pana, 4.9; Anna, 4.8; McLeansboro, 3.8.

*Indiana.*—Logansport, 21.8; Monticello and Lafayette, 18.5; Wabash, 18.2; Attica, 18.0; Fort Wayne, 17.2; Noblesville, 17.0; Greencastle, 16.2; Romney, 16.0; Spiceland, 15.0; Farm-land, 14.5; Richmond and Angola, 14.0; Connersville, 12.5; Mauzy, 12.2; Dana, 12.0; Indianapolis, 11.9; Frankfort, 11.0; Greenfield, 10.0; Terre Haute, 9.0; Bloomington, 6.7; Columbus, 5.5; Laconia, 5.0; Sunman, 4.5; Huntingburg, 3.7; Salem, 3.2; Vevay, 3.0.

*Iowa.*—West Union, 16.4; Keokuk and Indianola, 14.6; Cedar Rapids, 14.4; Muscatine, 12.7; Independence, 12.4; Ottumwa, 12.3; Logan, 12.0; Dubuque, 11.2; Des Moines and Madison, 10.0; Monticello, 9.2; Round Grove, 9.0; Oskaloosa, 6.5; Davenport, 6.2.

*Kansas.*—Salina, 18.0; Fort Scott, 10.0; Sherlock and Clay Centre, 8.8; Allison, 7.5; Lawrence, 6.5; Yates Centre, 6.4; Wyandotte, 6.2; Independence, 5.5; Dodge City, 5.4; Elk Falls and Topeka, 5.0; Maud, 4.5; Wellington and Holton, 4.2; Leavenworth, 3.8; Atchison, 3.5.

*Maine.*—Gardiner, 18.5; Orono, 16.0; Portland, 10.4; Eastport, 7.5.

*Maryland.*—Cumberland, 9.0; Fallston, 6.0; Baltimore, 3.8.

*Massachusetts.*—Williamstown, 21.0; Rowe, 19.0; Fall River, 18.0; Springfield, 16.8; Kingston, 16.5; Worcester, 15.0; Westborough, 13.5; Leominster, 12.0; Cambridge, 11.6; Amherst, 11.5; Somerset, 11.4; Princeton, 9.9; New Bedford, 9.0; Milton, 8.0; Taunton, 7.8; Chestnut Hill, 7.5; Mendon, 6.0.

*Michigan.*—Marquette, 67.3; Kalamazoo, 37.0; Mackinaw City, 35.0 (†); Boyne, 33.5; Mottville, 29.0; Alpena, 26.3; Traverse City, 24.5; Ionia, 23.8; Hudson, 19.8; Manistiquie, 19.2; Lansing, 18.7; Hillsdale, 17.4; Moorestown, 16.4; Thornville, 16.0; Escanaba, 14.7; Grand Haven, 13.6; Port Huron, 9.8; Detroit, 8.6.

*Minnesota.*—Minneapolis, 24.6; Chester, 23.0; Northfield, 20.8; Duluth, 17.0; Saint Paul, 14.9; Saint Vincent, 11.7; Moorhead, 8.0.

*Montana.*—Fort Custer, 35.3; Fort Shaw, 24.7; Helena, 15.6; Fort Benton, 13.7; Fort Maginnis, 8.2; Fort Assinaboine, 7.1.

*Missouri.*—Saint Louis, 9.6; Conception, 5.0.

*Nebraska.*—Madison, 18.0; Genoa, 16.5; Fremont, 14.6; De Soto, 12.1; Red Willow, 10.0; Tecumseh, 8.0; Omaha, 5.9; Stockham, 3.8.

*Nevada.*—Otego, 29.0; Toano, 19.0; Winnemucca, 17.0; Wells, 13.5; Halleck, 7.8; Palisade and Elko, 6.0; Hawthorn, Wadsworth, and Hot Springs, 4.0; Beowawe, 3.0.

*New Hampshire.*—Grafton, 18.5; Concord, 18.0; Hanover, 17.0; Contoocook and Antrim, 16.0; Manchester, 13.5; Mount Washington, 7.7.

*New Jersey.*—Paterson, 11.2; Somerville, 10.2; South Orange, 9.5; Vineland, 6.2; Cape May, 4.2.

*New Mexico.*—Santa Fé, 18.6; Lordsburg, 3.0.

*New York.*—Rochester, 27.1; Humphrey, 22.0; Port Jervis,

20.0; Menand Station (near Albany), 16.6; Auburn 16.4; Buffalo, 15.8; Mountainville, 14.0; Factoryville, 13.5; Coopers-town and Palermo, 12.0; Oswego, 10.6; Penn Yan, 10.5; White Plains, 10.0; Le Roy, 9.6; New York City, 9.4.

*North Carolina.*—Asheville, 5.5.

*Ohio.*—Sandusky, 33.0; North Lewisburg, 24.5; Garrettsville, 21.8; Wauseon, 18.5; Margaretta and Ruggles, 18.0; Cleveland, 15.5; Hiram and New Athens, 14.0; Toledo, 10.5; Westerville, 9.4; Jacksonburg, 7.0; Cincinnati, 6.6; College Hill, 6.0; Columbus, 5.1; Portsmouth, 3.8.

*Oregon.*—Eola, 60.8; Albany, 36.0; East Portland, 28.0.

*Pennsylvania.*—Eola, 15.0; Tamaqua, 14.6; Troy, 14.2; Blooming Grove, 13.0; Drifton, Leetsdale and Grampian Hills, 12.5; Catawissa, 9.3; Wellsboro, 9.0; Pittsburg, 8.4; Chambersburg, 8.0; Fallsington, 7.4; Westchester, 7.2; Philadelphia, 4.6; Germantown, 4.5; Howard College, 3.2.

*Rhode Island.*—Providence, 16; Nyatt Point, 11.8; Pawtucket, 9.4; Point Judith, 7.1.

*Texas.*—Fort Elliott, 6.3.

*Utah.*—Nephi, 19.7; Promontory, 14.0; Kelton, 12.0; Terrace, 11.6; Salt Lake City, 11.0; Ogden, 7.5; Blue Creek, 6.5.

*Vermont.*—Woodstock, 23.2; Strafford, 23.0; Charlotte, 22.0; Newport, 21.2; Lunenburg, 21.0; Dorset, 19.5; Burlington, 17.0.

*Virginia.*—Accotink, 5.0; Lynchburg, 3.4; Dale Enterprise, 3.0.

*Washington Territory.*—Dayton, 54.0; Spokane Falls, 30.2; Port Angeles, 22.9.

*West Virginia.*—Helvetia, 8.2.

*Wisconsin.*—Embarras, 29.0; Manitowoc, 25.0; Franklin, 23.0; Wausau, 19.0; La Crosse, 18.5; Prairie du Chien, 15.8; Neillsville, 14.0; Lancaster, 13.4; Beloit, 13.2; Sussex, 12.8; Madison, 12.2.

*Wyoming.*—Fort Bridger, 25.4; Cheyenne, 5.0.

#### DEPTH OF UNMELTED SNOW ON GROUND AT END OF THE MONTH.

[Expressed in inches and tenths.]

*Arizona.*—Fort Grant, 1.5.

*California.*—Fort Bidwell, 3.5.

*Colorado.*—Pike's Peak, 10.0; West Las Animas, 5.0; Pueblo, 2.0; Denver, 1.0.

*Connecticut.*—Hartford, trace.

*Dakota.*—Fort Sully, 12.0; Yankton, 7.0; Fort Bennett, 6.1; Fort Totten, 6.0; Deadwood, 5.5; Fort Buford, 4.5; Huron and Richardton, 4.0; Webster, 3.0.

*Idaho.*—Boisé City, 15.2; Lewiston, 10.3.

*Illinois.*—Riley, 0.2; Chicago and Bunkerhill, trace.

*Indiana.*—Indianapolis and Greencastle, 0.2; Spiceland, trace.

*Iowa.*—West Union, 6.0; Des Moines and Indianola, 5.0; Ottumwa, 4.0; Independence, 3.5; Oskaloosa, 3.0; Monticello and Muscatine, 2.0; Dubuque, 1.0; Round Grove, 0.5.

*Kansas.*—Salina, 9.0; Allison, 6.5; Sherlock, 6.0; Dodge City, 4.0; Maud, 3.0; Topeka, Wellington and Wyandotte, 2.0; Yates Centre, Elk Falls and Atehison, 0.5.

*Maine.*—Gardiner, 7.0; Eastport, trace.

*Maryland.*—Cumberland, 2.0.

*Michigan.*—Marquette, 50.0; Northport and Traverse City, 10.0; Manistique, 9.9; Escanaba, 4.5; Boyne, 3.0; Grand Haven, 0.5; Alpena, 0.2; Hillsdale, 0.1; Ionia, trace.

*Minnesota.*—Northfield, 15.0; Saint Paul, 13.0; Saint Vincent and Duluth, 10.0; Moorhead, 3.0.

*Montana.*—Helena, 14.5; Fort Shaw and Fort Custer, 10.0; Fort Maginnis, 7.8; Fort Assinaboine, 6.05; Fort Benton, 5.0.

*Missouri.*—Conception, 3.0; Saint Louis and Pierce City, trace.

*Nebraska.*—Genoa, 10.0; Fremont and Red Willow, 8.0; De Soto, 6.2; Madison and Tecumseh, 6.0; Omaha, 4.5; North Platte, 2.5; Stockham, 1.5.

*Nevada.*—Winnemucca, 1.0.

*New Hampshire.*—Mount Washington, 1.0.

*New Mexico.*—Santa Fé, 18.0 on mountains and 5.0 in valleys.

*New York.*—Oswego, in drifts; Auburn, 2.0; Albany, Rochester, Le Roy, North Volney, Palermo, Ithaca, Mountainville and Humphrey, trace.

*Ohio.*—Toledo, trace.

*Oregon.*—Albany and Eola, 18.0

*Pennsylvania.*—Wellsboro, 2.0; Chambersburg, 1.0; Catawissa, trace.

*Rhode Island.*—Providence, 1.0.

*Utah.*—Salt Lake City, trace.

*Vermont.*—Woodstock, 6.0; Strafford, 1.0; Dorset, trace.

*Washington Territory.*—Spokane Falls, 28.0; Dayton, 26.0.

*Wisconsin.*—Embarras, 16.8; Wausau, 13.0; Neillsville, 9.0; Manitowoc and La Crosse, 6.0; Lancaster, 4.0; Madison, 2.0.

*Wyoming.*—Cheyenne, 0.5.

#### SLEET.

Sleet fell during the month as follows:

*Arizona.*—Willcox, 29th.

*Arkansas.*—Fort Smith, 26th, 27th; Lead Hill, during night of 26–27th.

*California.*—San Francisco, 30th.

*Connecticut.*—Bethel and New Haven, 21st; New London, 28th.

*District of Columbia.*—Washington City, 19th, 20th, 21st.

*Georgia.*—Milledgeville, 20th; Atlanta, 21st.

*Idaho.*—Boisé City, 4th, 20th, 25th.

*Illinois.*—Sandwich, 27th; Springfield, 20th, 27th, 30th.

*Indiana.*—Vevay, 21st; Lafayette, 27th; Sunman, 12th, 13th, 21st, 29th; Logansport, 27th; Greencastle, 11th, 12th, 21st, 22d; Indianapolis, 11th, 14th, 16th.

*Iowa.*—Humboldt, 5th, 26th; Ottumwa, 2d, 27th, 29th, 30th; Des Moines, 30th.

*Kansas.*—Salina, 11th, 29th, 30th; West Leavenworth, 29th; Independence, 30th; Holton, 9th, 26th, 29th; Leavenworth, 21st, 26th, 27th.

*Louisiana.*—Liberty Hill, 26th.

*Maine.*—Portland, 23d; Eastport, 15th.

*Maryland.*—Fort McHenry, 29th; Emmitsburg, 14th, 20th; Baltimore, 14th, 21st, 22d; Fallston, 14th.

*Michigan.*—Grand Haven, 27th; 31st; Escanaba, 7th, 29th, 30th, 31st.

*New Hampshire.*—Mount Washington, 6th, 7th.

*New York.*—Forts Columbus and Hamilton, 14th; West Point, 22d; Albany, 21st, 22d; Rochester, 13th, 15th; New York City, 12th; Oswego, 11th, 14th.

*North Carolina.*—Lenoir, 21st; Weldon, 24th; Statesville, 18th, 20th, 21st, 22d, 23d; Charlotte, 21st, 28th; New River Inlet, 26th; Fort Macon, 18th, 19th; Wilmington, 18th, 20th.

*Ohio.*—Wauseon, 14th, 15th, 22d, 27th; Columbus, 12th, 20th; Toledo, 14th.

*Pennsylvania.*—Leetsdale and Pittsburg, 10th.

*Rhode Island.*—Narragansett Pier, 12th.

*Tennessee.*—Milan, 17th; Nashville, 17th, 27th; Chattanooga, 20th, 21st; Knoxville, 18th.

*Texas.*—Clarksville, 26th; Palestine, 25th; El Paso, 29th, 30th.

*Utah.*—Salt Lake City, 3d.

*Virginia.*—Norfolk, 18th; Wytheville, 21st; Lynchburg, 21st, 24th; Fort Myer, 14th, 21st, 27th.

*Washington Territory.*—Dayton, 19th, 26th; Fort Canby, 31st.

*Wisconsin.*—Beloit and Embarras, 27th; Prairie du Chien, 26th, 27th; Milwaukee, 12th, 27th.

*Wyoming.*—Cheyenne, 23d.

#### HAIL.

*Arizona.*—Wickenburg, 8th, 9th, 12th; Fort Grant, 9th; Tucson, 8th, 28th.

*Arkansas.*—Mount Ida, 26th.

*California.*—Fall Brook, 7th; Poway, 12th.

Table of excessive and greatest monthly precipitation—December, 1884.

Station.	Specially heavy.		Largest monthly.	Station.	Specially heavy.		Largest monthly.
	Date.	Amt.			Date.	Amt.	
<b>Alabama.</b>				<b>Illinois—Cont'd.</b>			
Prattville.....	14	3.50	8.39	Springfield.....	27, 28	2.79	
Tusculum.....	21	2.54	7.03	Brunker Hill.....	27, 28	3.08	
Clanton.....	14	2.79	7.06	Logansport.....	27, 28, 29	3.81	
Carrollton.....	14	3.10	7.05	<b>Indiana.</b>			
Gadsden.....	14	2.00	6.91	Princeton.....		7.70	
Do.....	21	2.25		Marengo.....		7.55	
Florence.....	21	2.32	6.53	Wilmington.....		7.20	
Mount View.....	20, 21	3.00	6.45	Fillmore.....		7.04	
Greensboro.....			6.09	Corydon.....		6.85	
Greene Springs.....	14	2.05		Farmland.....		6.79	
Wetumpka.....	14	2.50		Greencastle.....		6.74	
Tuscaloosa.....	14	3.40		Huntingburg.....		6.60	
Marion.....	14	2.00		Degonia Springs.....		6.52	
Edwardsville.....	21	2.00		Spiceland.....	27	2.71	
<b>Arizona.</b>				Lafayette.....		6.47	
Fort Bowie.....	13	2.30	6.41	Mauzy.....		6.14	
Phoenix.....	12, 13	2.50		Indianapolis.....	27, 28	2.39	
San Carlos.....	27, 28	2.04		Columbus.....		6.05	
<b>Arkansas.</b>				Terre Haute.....	27	2.25	
Little Rock.....	27 to 30	11.23	16.92	<b>Louisiana.</b>			
Mount Ida.....	10, 11	3.75	15.95	Point Pleasant.....	5	3.01	20.39
Do.....	26 to 30	10.35		Do.....	14	5.01	
Lead Hill.....	10, 11	2.06	11.37	Do.....	20, 21	4.03	
Do.....	26, 27, 28	5.82		Do.....	28, 29, 30	8.03	
Fort Smith.....	27, 28	2.69	6.30	Shreveport.....	10, 11	3.55	15.55
<b>California.</b>				Do.....	27 to 30	13.41	
Emigrant Gap.....			31.20	Grand Coteau.....	10	3.25	14.43
Colfax.....			23.60	Do.....	16, 17	2.45	
San Raphael, near	17 to 21	11.45	20.96	Do.....	27 to 30	4.67	
Do.....	23 to 26	7.59		New Orleans.....	13, 14	2.49	8.01
Cieco.....			25.00	Luling.....			6.13
Auburn.....			10.37	<b>Maine.</b>			
Calistoga.....			15.08	Eastport.....	7	2.38	8.63
Delta.....			10.41	Do.....	21, 22	3.74	
Bedding.....			14.51	Portland.....	15	2.30	6.42
Fort Gaston.....	15, 16, 17	4.61	14.49	Orono.....	20, 21	2.20	
Do.....	21, 22, 23	4.68		<b>Maryland.</b>			
Alta.....			14.08	Fallston.....	6	2.80	6.05
Aptas.....			11.34	Ocean City.....			6.04
Truckee.....			13.24	<b>Massachusetts.</b>			
Sacramento.....	17 to 26	10.30	10.45	Princeton.....	6, 7	4.83	9.59
Napa.....			10.16	Do.....	21, 22	3.75	
Santa Cruz.....			8.91	Milford.....			7.70
Gilroy.....			8.83	Fall River.....	6, 7	2.00	6.94
Ione.....			8.22	Northampton.....			6.51
Tennant.....			8.11	Rowe.....	6	2.00	
Petaluma.....			8.07	New Bedford.....	21, 22	2.00	
Angel Island.....			7.85	<b>Michigan.</b>			
Rocklin.....			7.75	Marquette.....	6, 7	2.59	8.65
Oakland.....			7.73	Kalamazoo.....			7.14
Red Bluff.....	16, 17, 18	3.76	7.73	Grand Haven.....	29, 30	2.42	6.80
San Francisco.....	19, 20	2.25	7.68	Boyne.....			6.52
Do.....	23, 24	2.53		Mackinaw City.....			6.48
San Mateo.....			7.59	<b>Mississippi.</b>			
Suisun.....			7.46	Vicksburg.....	28 to 31	9.25	14.09
Pajaro.....			7.45	<b>Missouri.</b>			
Boca.....			8.20	Pro Tem.....			11.37
Benicia Barracks.....	24, 25, 26	4.54	7.19	Pierce City.....	5	2.00	10.10
Dunningan.....			7.16	Do.....	10, 11	3.00	
Fall Brook.....	12, 13	2.21	7.15	Springfield.....	28, 29	2.40	7.62
Fort Bidwell.....			6.81	Ironton.....			7.47
Farmington.....			6.21	Centerville.....			7.22
Brighton.....			6.17	Carthage.....			6.91
Galt.....			6.06	Saint Louis.....	27, 28	3.09	6.18
Princeton.....	16, 17	2.48	6.03	<b>New Jersey.</b>			
South Valejo.....			6.03	Atlantic City.....	21, 22	3.14	7.71
Los Angeles.....	25	3.01		Barneget City.....	21, 22	3.02	7.09
Poway.....	25	2.07		Readington.....			7.00
Presidio of San				Cape May.....	21, 22	3.19	6.87
Francisco.....	23	2.00		Vineland.....			6.53
<b>Connecticut.</b>				Paterson.....	6, 7	2.35	
Voluntown.....	6, 7	2.90	8.00	Little Egg Harbor.....	21, 22	2.01	
Do.....	15	2.00		<b>New York.</b>			
Do.....	21, 22	2.20		David's Island.....	6	2.25	8.75
Wallingford.....			7.52	Do.....	21, 22	3.25	
Shelton.....			7.37	New York City.....	21	2.10	6.66
New London.....	6, 7	2.27	7.30	Fort Columbus.....	21, 22	2.28	6.44
Middleton.....			7.20	West Point.....			6.20
Bethel.....	21, 22	2.00	6.52	Fort Jervis.....	6	2.32	
Southington.....			6.45	White Plains.....	6	2.40	
New Haven.....	21, 22	2.21	6.41	Fort Hamilton.....	14	2.10	
Hartford.....			6.09	<b>North Carolina.</b>			
Norfolk.....			6.04	Brevard.....	5, 6	2.85	10.25
<b>Florida.</b>				Do.....	14, 15	2.78	
Newport.....	5	3.80	10.99	Do.....	20, 21	2.75	
Do.....	12, 13, 14	3.98		Kelley's, near			
Do.....	21, 22	2.08		Raleigh.....			9.40
Cedar Keys.....	5, 6	5.16		Lincolnton.....			9.32
<b>Georgia.</b>				Lenoir.....	5, 6	2.60	8.10
Quitman.....	6	3.70	6.60	Do.....	14	2.00	
Atlanta.....	14	3.74	6.09	Hatteras.....	21, 22	2.73	7.41
Athens.....	14, 15	2.95		Chapel Hill.....	5, 6	3.01	6.98
Augusta.....	21, 22	2.16		Weldon.....	5, 6	2.68	
<b>Idaho.</b>				Charlotte.....	21, 22	2.12	
Albion.....	14	2.00	7.34	<b>Oregon.</b>			
Boise City.....	16, 17	2.22		Roseburg.....	16, 17	3.35	9.20
<b>Illinois.</b>				Fort Klamath.....	22, 23, 24	3.60	8.68
Anna.....	28, 29, 30	6.30	9.57	Albany.....	17, 18	3.84	7.83
Cairo.....	11	2.46	8.99	Portland.....			7.52
Do.....	27 to 30	4.94		Astoria.....			6.55
McLeansboro.....			5.21	Eola.....			6.09
Collinsville.....	27, 28	3.02	7.62	<b>Pennsylvania.</b>			
Mascoutah.....			6.90	Tamaqua.....	6	2.30	7.40
Rockford.....			6.51	Westchester.....	6, 7	2.62	7.00

Table of excessive and greatest monthly precipitation—Continued.

Station.	Specially heavy.		Largest monthly.	Station.	Specially heavy.		Largest monthly.
	Date.	Amt.			Date.	Amt.	
<b>Pennsylvania—C'd.</b>				<b>Tennessee—Cont'd.</b>			
Quakertown.....			6.46	Farmington.....	21	2.25	6.73
Wellsborough.....	6, 7	4.66	6.39	Parkersville.....	21	2.72	6.51
Easton.....			6.07	Grief.....	21	2.70	6.49
Fallsington.....			6.00	Carysville.....	14	2.00	6.21
Lafayette.....	6	2.00		Do.....	21	2.10	
Bloomington.....			2.90	Howell.....	21	2.46	6.19
<b>Rhode Island.</b>				Knoxville.....	20, 21	2.37	6.11
Pawtucket.....			7.07	Marysville.....	21, 22	3.65	6.00
Nyat Point.....	6, 7	2.10	7.03	Phulaski.....	21	2.10	
Providence.....			6.59	Covington.....	28, 29	2.84	
Block Island.....			6.56	Grassy Cove.....	21	2.06	
Narragansett Pier			6.34	McMinville.....	21	2.10	
<b>South Carolina.</b>				<b>Texas.</b>			
Aiken.....	6, 7	2.04	6.02	Galveston.....	27, 28	6.71	9.44
Do.....	22, 23	2.25		Clarksville.....	28, 29, 30	4.00	7.48
Pacolett.....			6.00	Palentine.....	10, 11	3.77	6.94
Stateburg.....	6, 7	3.65		Fort Concho.....	9, 10	2.90	
<b>Tennessee.</b>				<b>Utah.</b>			
Memphis.....	28, 29, 30	5.35	9.14	Nephi.....	21, 22	2.40	
Dyersburg.....	27, 28, 29	5.01	8.85	<b>Virginia.</b>			
Somerville.....	29, 30	2.39	7.91	Lynchburg.....	21	6.74	11.81
Milan.....	27, 28	2.03	7.25	Dale Enterprise.....	6	2.00	
Fostoria.....	14	2.00	7.20	<b>Washington Ter.</b>			
Do.....	21	2.85		Olympia.....	18, 19	3.67	
Trenton.....	28, 29, 30	3.62	7.14	<b>Wisconsin.</b>			
Flat Creek.....	21	2.62	7.04	Franklin.....	29, 30	2.25	
Chattanooga.....	21, 22	2.91	6.80				

**Connecticut.—Hartford, 21st.**

Delaware.—Delaware Breakwater, 10th, 24th.

District of Columbia.—Washington City, 14th.

Illinois.—La Fayette, 27th.

Iowa.—Guttenberg, 1st; Independence and Monticello, 27th; Ottumwa, 30th.

Kansas.—Wyandotte, 9th, 30th; Yates Centre, 30th.

Louisiana.—Liberty Hill, 26th.

Maine.—Gardiner, 21st.

Maryland.—Woodstock, 14th, 20th.

Massachusetts.—Westborough, 22d.

Michigan.—Fort Brady, 31st; Boyne, 27th.

New York.—Fort Columbus, 9th, 14th; Factoryville, 21st.

North Carolina.—Weldon, 18th, 21st.

Pennsylvania.—Dyberry, 14th; Easton, 15th.

South Carolina.—Stateburg, 22d.

Texas.—Fort Concho, 30th; Clarksville, 4th.

Virginia.—Fort Myer, 14th; Wytheville, 6th; Dale Enterprise, 21st.

Washington Territory.—Port Angeles, 5th; Pysht, 25th.

Wisconsin.—Embarras, 9th, 23d, 27th, 30th, 31st; Manitowoc, 27th.

**SNOW FROM A CLOUDLESS SKY.**

Toledo, Ohio: snow fell from a cloudless sky from 10.35 to 10.55 p. m. on the 26th.

**WINDS.**

The most frequent directions of the wind during December, 1884, are shown on chart ii. by arrows flying with the wind; they were from north to northwest in the upper Mississippi and Missouri valleys, and extreme northwest; from south to west in the lake region; from northeast to northwest on the Atlantic coast; from east to south in the Gulf states; in the remaining districts they were variable.

**HIGH WINDS.**

(In miles per hour.)

High winds occurred during the month as follows:

Sandy Hook, New Jersey, 60 n., 19th.

Barneget City, New Jersey, 56, s., 6th.

Cape May, New Jersey, 60, w., 9th.

Delaware Breakwater, Delaware, 51, nw., 9th.

Cape Henry, Virginia, 54, nw., 9th.

Kitty Hawk, North Carolina, 60, n., 18th.

Buffalo, New York, 64, sw., 15th.

Rochester, New York, 54, w., 15th.

Fort Elliott, Texas, 60, n., 4th.